they died sooner than those without any substitute for their blood. —*DuBois' Archiv*, 1883, 2 and 3 Hft.

VASO-MOTOR NERVES.—Professors Bowditch and J. W. Warren have made a series of experiments upon this subject. The view that the temperature of the skin is only dependent on the degree of the vaso-dilatation forms the groundwork of the most recent observations upon the vaso-motor nerves of the extremities. Although this view is very probable, the opinions of different authors are so antagonistic that a new test of the activity of the nerves concerned, by another method, seemed desirable. They made plethysmographic experiments upon the influence of irritation of nerves upon the amount of blood in a limb. Their results are as follow:

1. Irritation of the peripheral end of the freshly-divided sciatic in a curarized cat, by means of tetanizing induction-currents, can cause, in six to fifteen seconds, increase and decrease of volume.
2. Induction-currents quickly succeeding each other, 16 to 64 per second, as a rule, caused a contraction of the blood-vessels (decrease of volume in the limb), whilst slow irritation (4—0.2 beats in a second) was followed by a dilatation.
3. Induction-breaks of great frequency cause in the beginning a contraction, and then a dilatation of the blood-vessels. By forty-two animals, dilatation in one only preceded.
4. By a few experiments, with especially exact methods, to estimate time, the contraction had a latent period of 1.5″, whilst the latent time for a dilatation amounted to about 3.5″.
5. The vaso-dilatation lasts a few minutes after the irritation ceases, whilst the vaso-contraction usually stops with the irritation. —*Centralblatt f. d. med. Wissenschaften*, 1883, No. 29.

THE RELATION BETWEEN THE ACTIVE PHASES OF CONTRACTION AND THE LATENT PERIOD OF SKELETAL MUSCLE.—Drs. Yeo and Cash have made a large number of experiments upon this subject, using the gastrocnemius of the frog. Their results are as follow:

1. Increase in the strength of the stimulus is accompanied by: (*a*) a steady and gradual shortening of the latent period; (*b*) a sudden prolongation of the actual contraction when a certain degree of stimulation is reached; (*c*) an elevation of the altitude of the curve with the early and the final parts, of the increase; and (*d*) a removal of the summit to a later part of the curve as soon as the elongation of the curve is established.
2. Increase in the weight used as a burden for the muscle is accompanied by: (*a*) elongation of the latent period; (*b*) commonly a slight shortening of the duration of the contraction; (*c*) depression of the height of the curve; (*d*) no marked change in the position of the summit except in extreme cases.
3. The application of heat causes: (*a*) very marked and con-

tinuous shortening of the latent period ; (*b*) a gradual and distinct increase in the height of the curve ; and (*c*) a more rapid arrival at the summit, followed by a sudden fall of the lever, which usually passes considerably below the abscissa. Extreme warmth has, however, an opposite effect when above 90° F. : the altitude gets lower and the muscles remain contracted.

4. Cooling causes : (*a*) the latent period to rapidly increase ; (*b*) a great increase in the duration of the contraction ; (*c*) at first a slight elevation in the altitude (extreme cold, however, lowers it) ; (*d*) the initial part of the curve is flattened, and the summit is delayed until a later period.

5. Gentle activity seems to increase the rate and power of contraction. Very weak interrupted currents have an effect like that produced by gentle heat. If extreme fatigue be induced : (*a*) the latent period becomes much longer ; (*b*) the duration of the contraction is increased ; (*c*) the height of the curve is considerably lessened ; and (*d*) its summit is moved away from the beginning of the contraction toward the end of the curve.—*Foster's Journal of Physiology*, vol. iv, Nos. 2 and 3.

THE SPINAL CORD AND CEREBRAL CENTRES.—Prof. Schiff has lately made a series of studies upon the nervous system. His results are as follow :

The posterior columns at the lower part of the spinal cord are sensitive, and irritation causes pain. The sensibility is greater at their outer edge than in the middle line. In the cervical segment it is otherwise ; there irritation causes no pain, and generally no marked sensitiveness. He concludes that the longitudinal fibres of the posterior columns (independent of the regions where the nerve-roots are), by weak irritation, can cause an increase of sensitiveness, but not to the degree of pain. The posterior columns contain no motor fibres. The anterior columns are not irritable to organic irritations. A segment of the spinal cord which is robbed of its posterior columns conducts pain and pressure-sensations, but no tactile sensations. He does not believe that the use of pressure in a mercurial manometer is a measure of pain. The irritation of a nerve sets into activity vaso-constrictor and vaso-dilator centres, and by the overpowering action of the former centres the mercury rises. To the bladder and colon the spinal cord gives reflex movements, but no motor-conducting paths, but only kinesodic paths of conduction. There are irritable centripetal nerves which cause no consciousness of a sensation, which run only to the medulla oblongata, and are lost here in the reflex apparatuses. These centripetal nerves cause, when irritated, elevation of blood-pressure. To seek centres, the only method is by that of paralysis, for all centres are inexcitable to artificial irritants. He has found that the extirpation of Hitzig's and Ferrier's cortex centres neither paralyzes these muscles nor weakens them. There is only a modification in the position of the member, which